

REMARKS/ARGUMENTS

Claims 1-4 and 6-15 are canceled. New Claims 16 to 30 are active in the application.
Reconsideration is respectfully requested.

The present invention relates to aqueous dispersions comprised of water-soluble and/or water-swellaable cationic copolymers.

Specification Amendments

The specification has been amended to correct the errors noted by the Examiner and in order to correct spelling errors in the text. A fresh copy of the specification as requested is attached to the response.

Claim Objection

Claim 1 (new Claim 16) has been amended in order to correct the error noted.

Claim Amendments

The previously active claims have been canceled in favor of the newly presented claims. The new claims are supported by the original claims. New Claim 19 is supported by the disclosure at page 10, lines 8-13 of the specification. Entry of the new claims into the record is respectfully requested.

Claim Rejection, 35 USC 112

In considering the term “overall,” applicants point out that the specification says that the amphoteric dispersant’s charge is opposite to that of the water-soluble or water-swellaable polymer (paragraph [0011]). The problem which the present invention solves by providing novel aqueous dispersions of high molecular weight cationic water-soluble polymers in the

presence of amphoteric protective colloids of the opposite charge. In context the term "overall" has been used in order to establish a clearer distinction from dispersants having only negative or only positive molecular sites, that is, to distinguish amphoteric from merely anionic or merely cationic dispersants. Throughout the comparative examples, dispersants are used that exclusively contain either negatively charged molecular sites or positively charged molecular sites. In contrast to these examples, the dispersants of the invention possess negatively charged molecular sites as well as positively charged molecular sites at the same time. Note that it can be observed in the examples that the dispersants of the invention are negatively charged at the reaction conditions, i.e. at pH of 6.75.

Claim Rejection, 35 USC 103

Claims 1-4 stand rejected based on 35 USC 103 as obvious over Boeckh et al '517. This ground of rejection is respectfully traversed.

A primary goal in the present invention is the production of aqueous dispersions of water swellable and high molecular weight water soluble polymers that advantageously have low bulk viscosities (< 10000 mPas), high solids content (> 20 %), that dissolve readily and can be prepared with a broad range of cationicity. Improvements in stability of such dispersions has also been desired. The present invention represents an advance in this technology by providing aqueous dispersions of high molecular weight cationic water soluble polymers in the presence of amphoteric protective colloids of the opposite charge. The invention is accomplished by free radically initiating copolymerization of a monomer mixture of at least 1 to 99 % by wt of a cationic monomer or quaternizable monomer and 1 to 99 % by wt of a neutral monomer. (Optionally, a bi- or polyfunctional monomer can also be employed.) The copolymerization is conducted in the presence of 1-100 % of a mixture of

salts in an amount which is necessary to saturate the reaction medium, and in the presence of 0.1 to 20 % by wt of an amphoteric dispersant having an overall negative charge.

Focusing on Boechke et al, cationically modified, particulate, hydrophobic polymers, the surfaces of which have been cationically modified by coating with cationic polymers, are disclosed. For the purpose of cationically modifying the hydrophobic polymers, anionically stabilized or anionically charged hydrophobic polymers are surface treated with cationic polymers. (Thus, paragraph [0011] of the document states in the treatment of the anionically adjusted dispersions of the hydrophobic polymers with an aqueous solution of a cationic polymer, the charge of the originally anionically dispersed particles is changed such that, following the treatment, they preferably carry a cationic charge.) The anionic character of the polymers that are mentioned can be achieved by conducting the copolymerization in the presence of anionic protective colloids and/or anionic emulsifiers (see [0018]). However, nowhere does Boechke et al disclose the preparation of stable dispersions of cationic polymers in the presence of negatively charged amphoteric polymers, which is the salient feature of the present invention. Rather, in contrast to the present invention, Boechke et al uses positively charged, i.e., cationic polymers, to stabilize water insoluble, particulate, hydrophobic polymers. In fact, the reference teaches away from the invention because it describes the use of cationic polymers for dispersion stabilization instead of anionic amphoteric polymers as now discovered. Clearly, Boechke et al does not suggest the present invention and withdrawal of the rejection is respectfully requested.

Claim 2 (new Claim 17)

The subject matter of paragraphs [0084] and [0086] of the reference is to describe cationic polymers that are used to modify hydrophobic polymers. The Examiner, however, erroneously combines the teachings of the two paragraphs to maintain that Boechke et al also

discloses anionic amphoteric dispersants. Rather, these paragraphs simply refer to cationic polymers that are used to modify the hydrophobic polymers. It is noted that paragraph [0084] teaches the presence of small amounts of acid monomers which renders the resulting polymer cationic. Moreover, the homopolymers and copolymers described in paragraph [0086] are prepared from vinylamine which do not have any anionic charge at all. The only descriptions of amphoteric polymers in the reference are at paragraph [0051] where cationic are understood to mean amphoteric polymers which have a new cationic charge. That is, the polymers contain both anionic and cationic monomers in copolymerized form, but the molar proportion of the cationic units in the polymer is greater than that of the anionic units.

Paragraph [0055] also discloses a series of cationic monomers in the preparation of polymers. However, the contents of cationic units in the amphoteric copolymers exceeds the content of anionic units in the copolymers. Accordingly, overall the polymers have a cationic charge.

Claim 3 (new Claim 18)

Claim 3, by virtue of its dependency on Claim 16 and the incorporation of all of the limitations of Claim 16 therein, is patentably distinguished of Boechke et al. Withdrawal of the rejection of the claim is respectfully requested.

Claim 4 (new Claim 20)

As is clear from the discussion above, Boechke et al does not teach or suggest the utilization of anionic amphoteric polymers as dispersants for the preparation of cationic polymers. Accordingly, the reference does not suggest the aspect of the invention of Claim 4 (20).

As to the combination of Boechke et al with Huang et al, neither of the two documents teaches or suggests the salient feature of the present invention which is the preparation of stable dispersions of cationic polymers in the presence of negatively charged amphoteric polymers. Further, the references do not teach or suggest the process steps of the invention which requires the copolymerization of monomers to form a copolymer having a net positive charge in the presence of an amphoteric dispersant having a net negative charge. Accordingly, neither document teaches or suggests the dispersion of original Claim 4 (new Claim 20). From this it is clear that the combined documents do not suggest the various method aspects of Claims 6-12 and 15 which all ultimately depend upon the presently claimed dispersion. Withdrawal of the rejection is respectfully requested.

Claims 13 and 14 stand rejected based on 35 USC 103 as obvious over Boechke et al in view of Bhattacharya. This ground of rejection is respectfully traversed.

As pointed out above, the Boechke et al patent does not suggest either the present process of preparing a cationically charged polymer dispersion, nor the dispersion itself. Certainly, Bhattacharya does not improve upon this deficiency, because the reference only discloses personal care preparations which contain a cross-linked cationic vinyl addition polymer. No mention is made of the present cationically charged polymer dispersion. Accordingly, Claims 13 and 14 are unobvious over the cited references and withdrawal of the rejection is respectfully requested.

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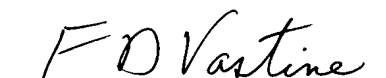
It is now believed that the application is in proper condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.
Norman F. Oblon

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 08/07)

A handwritten signature in cursive script, reading "FD Vastine", written in dark ink.

Frederick D. Vastine, Ph.D.
Attorney of Record
Registration No. 27,013